

ABSCESSSES OF THE SKIN AND SOFT TISSUES



Silver Denarius of the emperor Otho. 69 A.D. IMP M OTHO CAESAR AVG TR P, head right / SECURITAS P R, Securitas standing left holding wreath and sceptre. Rome, RIC 8. BMCRE 17. Sear RCV 2162.

In 58 A.D, the wife of twenty six year old, Marcus Salvias Otho, the beautiful Poppaea Sabina, caught the eye of the Emperor Nero. Nero was entranced by her. He wished to become her lover. He forced Otho to divorce her and then to get him out of the way he sent him to be governor of Lusitania (roughly the region of modern day Portugal) a far distant province of the western empire. Once out of the way Nero promptly forced Poppaea to become his second wife. Otho had no choice to comply. By all accounts he was a good administrator and much loved by those who served under him. Nero thought that was the end of matters - but Otho had a long memory.

Ten years later Nero, after a promising start to his reign, had become deeply unpopular by his ungoverned extravagances and increasingly flamboyant and aberrant behavior. He had offended not only the Senate and people of Rome, but more importantly many powerful generals that led the legions that protected the distant borderlands of the Empire. Finally, the governor of Iberia, Galba, a distinguished and accomplished general had had enough. His soldiers declared him rival emperor to Nero, but as he

governed a pacified region of the empire he had command of only one legion. He needed allies. Otho immediately declared for Galba, in the hope that he would one day become successor to the much older Galba, should that governor successfully depose Nero. Together they mobilized their forces and marched on Rome. Meanwhile Vitellius, commander of the powerful legions of the Rhine was also declared rival emperor to by his soldiers. Vitellius, thought that if Galba, the commander of a single legion could claim the throne, then he as commander of no less than seven legions could also claim it. In Rome Nero alarmed at the revolts in Iberia and on the Rhine, became positively terrified when news arrived that the legions on the Euphrates had also declared for Galba. On the 9th of June, 68 A.D he committed suicide. Galba beat Vitellius to Rome, where he was declared emperor. Otho had given Galba his allegiance in the hope that Galba would adopt him and name him his successor. Instead Galba chose to adopt a certain young man of impeccable lineage, but seemingly not much else to recommended him, by the name of Lucius Piso Lincinianus. Otho was devastated, and so were those of the Praetorian guard, who were loyal to Otho. A conspiracy was organized and on 15th of January 69 A.D Galba and Lucius were murdered and Otho took the throne.

The year 69. A.D was a watershed year. It set the motif for the rest of the history of Rome - one that Augustus would have despised, but in truth was partly responsible for - a failure to establish a stable method of succession by law. This was the single greatest failing of Imperial Rome. Galba was the first emperor to be raised to the throne by the legions and not the Senate. Otho established the method of subsequent succession - assassination of one's predecessor. Galba reigned for just seven months. Otho reigned for just three months, before committing suicide after his legions were defeated by those of Vitellius. Vitellius reigned for just eight months, before he, in turn, was murdered by soldiers loyal to the governor of Judea, Vespasian. Vespasian would have a long and prosperous reign. Though the precedent had been set that the legions would nominate their candidate for the throne, Vespasian set the precedent of how the candidate would succeed. As Alexander the Great declared on his deathbed, it would go to the strongest.

The ancient sources are fragmentary to say the least. In some periods such as the Roman "Dark Ages" of the mid-third century, extremely so. It is therefore intensely fascinating when we get rare firsthand accounts of the real life personalities of the emperors. We have such an account of Otho, left to us by Suetonius:

"...He was of medium height, bow legged, and with splay feet; but almost as fastidious about his appearance as a woman. His entire body had been depilated, and a toupee covered his practically bald head, so well made that no one suspected its existence. He shaved every day, and since boyhood had always used a poultice of moist bread to prevent the growth of his beard..."

We do not know why Otho held such a womanly obsession for hairlessness - (apart from his toupee). He most certainly was not of a "womanly" disposition. Many tantalizing idiosyncratic aspects of the personalities of individuals are recorded in the ancient sources for which we will never have understanding or insight into. They will forever remain speculative. In Otho's case about all we can really say is that he probably never had any medical issues in relation to skin abscesses!

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Introduction

Abscesses of the skin and soft tissues are a common presentation to the Emergency Department.

The severity of illness can range from trivial/ minor to life-threatening

In most cases, incision and drainage will be the definitive treatment.

See also separate documents on:

- **Mastitis (in O&G folder).**
- **Anorectal Abscesses (in General Surgical folder).**
- **Pilonidal Abscess (in General Surgical folder).**
- **Sonography of Soft Tissue Infections (in Radiology and Ultrasound folder)**

Pathophysiology

Organisms:

Staphylococcus aureus is the causative agent in up to 75% of cases.

There is an an increasing worldwide incidence of CA-MRSA.

Eighteen per cent of *S. aureus* infections in the Australian community are now caused by CA-MRSA; however, there is significant regional variation ranging from 5% in Tasmania to 35% in the Northern Territory.

CA-MRSA cannot be reliably excluded based on clinical, ethnic or socio-demographic factors.

Risk factors:

These include:

1. Local trauma:
 - Wounds/ retained foreign bodies.
2. IV drug abuse
3. Immunosuppression

- Diabetes
 - HIV
4. Crohn's Disease (for anorectal abscesses).
 5. Ingrown hairs/ infected hair follicles.

Complications:

These can include:

1. Extension to important/ vital structures
2. Generalized septicemia:
 - Including toxic shock syndrome.
3. Cosmetic deformity
4. Functional impairment

Clinical Features

The typical features of an abscess are well known and include the typical features of a mass and inflammation including:

1. Swelling
 - May be tense/ firm or fluctuant
2. Warm
3. Erythematous
4. Painful/ Tender

Differentiating indurated cellulitis from a deeper lying abscess however is difficult on purely clinical grounds.

Though an abscess may be obvious, clinical examination alone cannot be definitive in *ruling out* an abscess.

Not uncommonly drainage is attempted on a supposed abscess only to discover indurated cellulitis.

Investigations

In clear cut and uncomplicated cases, no investigations are necessary.

In more complex situations the following may be necessary:

Blood tests:

1. FBE
2. CRP

Baseline in unwell patients – may serve as a guide to response to treatment.

3. U&Es and glucose

Wound Swabs:

Most uncomplicated cases do not require routine wound swabs to be taken.

They should be taken in situations where:

1. Patients are systemically unwell/ septic.
2. Epidemiological surveillance is a priority:
 - Particularly in regions where there is a rising/ high incidence of community-associated methicillin resistant *Staphylococcus aureus* (CA-MRSA).
3. Where antibiotics are going to be prescribed.
 - This allows antibiotic therapy to be modified if treatment fails.

Blood cultures

These are not necessary unless the patient is systemically unwell and septic

They may also be considered in some cases where patients are significantly immunocompromised.

Needle Aspiration:

Blind needle aspiration can verify the presence of a collection in equivocal cases, but failure to aspirate pus does not necessarily exclude a drainable abscess.

False negatives might result from the needle being poorly directed, or might be due to pus viscosity, debris or loculated collections.

Conversely, aspiration of a small amount of pus does not guarantee that there is still more left to drain by incision and drainage.

Ultrasound:

This is the imaging investigation of first choice.

Bedside US imaging however is *operator dependent*.

Bedside US using a **high frequency linear probe** can reliably help identify an abscess.

Ultrasonic features include

1. Spherical with poorly defined borders.
2. Heterogeneous, anechoic or hypoechoic mass
3. Often compressible
4. Fluid movement or “pus-stalsis”:
 - This may be seen on light compression over a suspected abscess cavity is diagnostic, but not always present.

Indications for an ultrasound examination may include:

1. Those patients in whom physical examination cannot rule out a deep abscess,
2. In patients who have worsened or failed to improve despite appropriate antibiotic treatment for cellulitis.

It is worth noting that abscess and cellulitis pathology is a *dynamic* process and so serial US examinations may be necessary.

Ultrasound may also be considered in cases where a **retained foreign** body is suspected.

CT scan:

CT scanning might improve diagnostic accuracy in skin and soft tissue infections, but for most patients the associated exposure to ionising radiation, contrast and cost would not be justified.

Bedside US possibly has better sensitivity than CT, but has less specificity.

CT therefore may be useful when the diagnosis is uncertain.

MRI:

MRI is usually reserved for more deep seated collections, such as Psoas abscess.

Management

1. Analgesia:

- Simple oral analgesics are usually sufficient
- Titrated IV opioid may be required for more severe symptoms

2. Antibiotics:

Uncomplicated skin infections do *not* require routine antibiotics.

Incision and drainage remains the definitive treatment for abscesses.

Antibiotics (as an adjunct) are prescribed for:

- Systemically unwell/ septic patients
- Patients who are immunocompromised
- Those with an associated spreading cellulitis.
- Multiple abscesses
- Recurrent abscess

Options for empirical therapy include: ⁴

- **Flucloxacillin 500 mg (child: 12.5 mg/kg up to 500 mg) orally, 6 - hourly for 5 days.**
- **Cephalexin 500 mg (child: 12.5 mg/kg up to 500 mg) orally, 6-hourly for 5 days**

Cephalexin is used for patients hypersensitive to penicillins (*excluding immediate hypersensitivity*), and is often preferred in children, due to greater tolerability and better palatability of the liquid formulation.

For patients with immediate hypersensitivity to penicillins use:

- **Clindamycin 450 mg (child: 10 mg/kg up to 450 mg) orally, 8-hourly for 5 days**

Or

- **Trimethoprim + sulfamethoxazole 160+800 mg (child 1 month or older: 4 + 20 mg/kg up to 160 + 800 mg) orally, 12-hourly for 5 days.**

CA-MRSA should be covered if the infection is severe or the local incidence of CA-MRSA is high. **Clindamycin** remains active against the majority of Australian CA-MRSA isolates. Trimethoprim-sulphamethoxazole is also an alternative and might be particularly useful in children as it is available in oral suspension.

Modify therapy based on clinical response to empirical therapy and the results of cultures and susceptibility testing.

Even if CA-MRSA is isolated, empirical therapy may be adequate depending on the response to drainage.

Treatment for 5 days is generally sufficient, but a longer duration of therapy may be required for patients who are slow to respond or have a more severe infection.

3. Needle aspiration:

- The role of **ultrasound guided needle aspiration** as a *replacement* for incision and drainage is controversial.

It has been advocated as a potentially less invasive alternative, but in practice it has a much higher failure rate when compared to incision and drainage.

Therefore for most abscesses, needle aspiration should not in general replace incision and drainage but it is possible that abscesses in *some regions* of the body might respond well to this technique. **Breast abscesses** are an example.

4. Anesthesia for incision and drainage:

Adequate local anaesthesia of an abscess cavity can be difficult to achieve. This is often attributed to the acid pH of infected tissue impairing transmembrane migration of the local anaesthetic agent.

Field block:

- The commonest approach is a generous local field block, within the safe dosage range of the agent being used.

An **adequate** time period must be allowed for the block to become effective - around **30 minutes**.

Direct injection:

- Direct injection into the abscess cavity is often employed, especially when the borders of the abscess are less well defined.
- A drawback however, is the initial additional pain associated with increasing volume of the abscess cavity.

Regional block:

- This can be very useful if the abscess is clearly loculated within a territory that is readily amenable to this technique.

Nitrous oxide:

- This can be a useful adjunct to analgesia, for both the local block and the incisions and drainage procedure.

Procedural sedation:

In some situations this may be appropriate in the ED setting.

Options include:

- Propofol/ opioid
- Ketamine

General Anesthesia:

- This will be required in more complex cases, deep seated abscesses, often in children.

5. Incision and drainage:

- Classical teaching dictates a **single liner incision**.

This should be along skin tension lines where possible to minimize scarring.

Common errors include making the incision:

- ♥ Too small
- ♥ Too shallow an incision
- ♥ Inadequate blunt dissection and opening of loculations.

- **Cruciate incisions** have *not* been shown to be superior to an adequate linear incision and may result in a *worse* scar.

6. Irrigation:

- Many clinicians routinely irrigate an abscess cavity, although there is little consensus about the type and volume of fluid used to irrigate the cavity.

Normal saline can be used to irrigate the wound until clear effluent is washing from the abscess cavity.

7. Packing:

- Traditionally packing is inserted into the abscess cavity to prevent wound closure and allow for ongoing drainage of exudate, with review in 24 - 48 hours.

There is however no good evidence to support this practice, and many do not routinely do this now.

- For larger abscesses, use of a wick or drain might be considered in place of packing, especially for abscess incisions at risk of closing prematurely.

A non-adherent “wick” is placed in the incision for a period of 12-24 hours, although again there is no good evidence to recommend this.

8. Loop drainage:

- This is an emerging new technique, used as an alternative to incision and drainage³

It involves making two small stab incisions at each end of the abscess, opening the loculations to drain all pus, then inserting a subcutaneous drain through the two incisions and tying the ends in a loop.

Discharge instructions include taking a bath/shower twice daily for the first 3 days, followed by removal of the loop in 7-10 days, or when the drainage stops and any overlying cellulitis has resolved.

The modified cuff of a sterile glove has been proposed as a more readily available and equally safe alternative to a surgical drain or vascular loop tie in the ED.

Proposed benefits of the loop technique include:

- ♥ Reduced pain
- ♥ No need for painful packing changes

- ♥ Simplified follow-up
- ♥ Improved cosmesis.

9. Wound closure:

- The time-honoured conventional treatment of cutaneous abscesses is incision and drainage (I&D) followed by spontaneous healing with the incision left open, called **secondary intention**, also referred to as **secondary closure**.

In fact, primary closure of infected wounds, such as abscesses, is generally considered contraindicated.

Primary closure of abscesses has been described as an alternative to delayed secondary closure, and some small studies have not shown any differences in outcome.³

Some clinicians now consider primary closure on an individual basis, particularly for cosmetically sensitive areas such as the face.

If primary closure of an abscess cavity is to be undertaken, there should be loose suture approximation of the abscess cavity edges, after adequate debridement of all necrotic tissue.

Disposition:

In general terms skin/ soft tissue abscesses that should be referred to a Surgical Unit include:

1. Those near major neurovascular bundles.
2. Special regions:

These are of important **cosmetic** or **functional** significance:

- Face (generally Plastics Unit)
- Breast
- Perineum /Genitals
- Anorectal

3. Patient distress where a GA may be required:

- Where adequate anesthesia is difficult to obtain

- Patient non-cooperation
4. Large/ extensive more deep seated abscesses

References

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Dr J. Hayes

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